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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,545	10/06/2003	Michael S. Choi	06558/011002	3325

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EXAMINER
BUCHANAN, CHRISTOPHER R

ART UNIT	PAPER NUMBER
3671	

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/679,545

Applicant(s)

CHOI, MICHAEL S.

Examiner

Christopher R. Buchanan

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 16, 2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (GB 1,596,330) in view of Moore (US 6,062,313).

Regarding claims 3, 4, 6, 13, 14, and 17, Thompson discloses a method and system for developing a sub-sea hydrocarbons field including:

- Liquefying natural gas aboard a vessel using a liquid coolant aboard the vessel to obtain liquefied natural gas (page 1 lines 56-63);

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- Transporting the liquefied natural gas to an onshore terminal (page 2 lines 43-45);
- Re-gasifying the liquefied natural gas (page 3 lines 9-17);
- Obtaining a new batch of liquid coolant using energy recovered from the re-gasifying the liquid natural gas (page 3 lines 24-27); and
- Conveying separated gas to the vessel via a riser (page 2 line 35+).

Thompson fails to disclose de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas and conveying the produced oil to a storage tank on the seabed.

Moore discloses a method and system for developing a sub-sea hydrocarbons field that includes de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas (column 6 lines 29-35, column 5 lines 20-25), and conveying and storing the produced oil to a storage tank (40) on the seabed (Fig. 1) (claims 3, 6, 13 and 17). Moore also discloses the produced gas being conveyed to the vessel via a riser (Fig. 1, column 3 lines 40-41) (claims 4 and 14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method and system of Thompson to include fluid separation and seabed oil storage, as taught by Moore, because most natural gas fields have associated oil production that must be stored or piped to shore (Thompson; page 16-19), and seabed tanks provide an economical, environmentally-safe, and transportable storage means. Furthermore, it is well-known and common practice to

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separate the production hydrocarbons into gaseous and liquid (oil) components and to transport and store them as necessary.

Regarding claims 5 and 15, Thompson discloses pre-treating the produced gas at a natural gas pre-treating facility before liquefying (page 1 lines 69-75). Regarding claim 7, Thompson discloses liquefying a new batch of natural gas using the new batch of liquid nitrogen aboard the vessel (page 2 lines 48-51). Regarding claim 8, Thompson discloses one of a plurality of storage tanks aboard the vessel is inherently empty to receive an initial portion of the liquefied natural gas (page 2 lines 43-45). Regarding claim 9, Thompson discloses that the re-gasifying the liquid natural gas is performed at the onshore terminal (page 2 lines 77-78 and page 3 lines 9-17). Regarding claim 10, Thompson discloses that the re-gasifying of the liquefied natural gas produces high pressure gas (page 3 lines 17-22). Regarding claim 11, Thompson discloses the method further comprises sending the high pressure gas to a pipeline (page 3 lines 30-34). Regarding claim 12, Thompson discloses transporting the liquefied natural gas to the onshore terminal is performed using the vessel (page 2 lines 45-46). Regarding claim 18, Thompson further discloses transporting the new batch of liquid nitrogen offshore aboard the vessel inherently using a plurality of storage tanks (page 2 lines 40-48).

4. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (GB 1,596,330) in view of Moore (US 6,062,313) and further in view of Giannesini et al. (US 5,295,546).

The combination of Thompson and Moore disclose a system for developing an oil and gas field as described above, but fail to disclose a power and control buoy configured to provide electric power and control functions for the sub-sea separation system.

Giannesini discloses a system for developing an oil and gas field that includes a power and control buoy configured to provide electric power and control functions for sub-sea operations (column 7 lines 1-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Thompson and Moore to include a power and control buoy in the system, as taught by Giannesini, because providing power and control via a buoy allows for continuous electrical power to sub-sea operations even when the vessel is transporting liquefied natural gas to shore. Furthermore, it is well-known and common practice in the art to use power and control buoys to provide electric power and control functions for sub-sea operations.

Response to Arguments

5. Applicant's arguments filed August 16, 2006 have been fully considered but they are not persuasive.

Applicant argues the prior art used in the rejection do not disclose the claimed features of the invention. The examiner disagrees and stands by the rejection above.

Applicant further argues there is no motivation to combine the Thompson and Moore references and the Moore reference does not constitute analogous art because it

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is directed to well drilling and the Thompson reference is directed to production.

However, Moore specifically notes that the device described therein may be used in well production applications, see column 6 lines 29-35: "production from one or more wells can be stored in one or more of the tanks that are positioned on the subsea floor or on land and connected to the wells." Like Thompson, Moore describes the device as being usable in a subsea hydrocarbon production environment, thereby making the Moore reference analogous art. It therefore would have been obvious to one of ordinary skill in the art to combine the Thompson and Moore references because most natural gas fields have associated oil production that must be stored or piped to shore, and seabed tanks provide an economical, environmentally safe, and transportable storage means.

Additionally, production fluids inherently contain entrained gas, and Moore describes entrained gas as being separable and conveyable directly to a platform vessel, as described in column 5 lines 20-25. While Moore does not specifically state a process of separating gas from produced hydrocarbons, one of ordinary skill in the art can reasonably infer that produced fluids will be separated with the separating apparatus 48, with the produced gas flowing up to the vessel and produced oils being held in the tank 40, as suggested by Moore in column 5 lines 20-25 and column 6 lines 29-35. It is irrelevant as to whether or not such gas separation is "temporary" as there are no claim limitations describing the timing or extent of such separation. The examiner points out that Moore specifically describes in column 6 lines 29-35 conveying produced oil to a seabed storage tank: "production from one or more wells can be stored in one or more of the tanks 40 that are positioned on the subsea floor." Conveying fluids from the

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well to the tank would inherently require a conveyance structure such as inlet conduit 44 described in Moore.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Buchanan whose telephone number is 571-272-8134. The examiner can normally be reached on Mon.-Fri. 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Will can be reached on 571-272-6998. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CB


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